METEOROLOGY IN CZECHOSLOVAKIA

By Mikulas Konecek

F O R E W O R D

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[Following is the translation of an article Mikulas Koncek, Corresponding Member of the Slovakian Academy of Sciences, entitled "Development of Meteorology in Czechoslovakia Since 1945" in Studia Geophysica et Geodetica, No 4, Prague, 1960, pages 111-118.]

Meteorological and Climatological Institute of the University imeni Komensky, Bratislava
[Note: Address: Trnavska Road 1, Bratislava]

During the time of the Second World War and the German occupation, the development of meteorology in Czechoslovakia had to all intents and purposes come to a complete halt. Higher educational institutions on Czech soil were closed down by the German authorities on 17 November 1939; the State Meteorological Institute continued to function merely as the main coordinating body of the climatological service in the territory of Bohemia and Moravia. At this time, the State Hydrological and Meteorological Institute was organized in the town of Bratislava, Slovakia; the main task of this institution was the maintenance and administration of the existing network of observation stations and in the preparation of archive materials for further processing and study. After the opening of the natural sciences department at the University imeni Komensky in Bratislava, students studying physics and geography had an opportunity to hear lectures on meteorology and climatology, but only on a limited scale. At the Slovakian Polytechnic Institute, lectures on meteorology and climatology were made available only insofar as the need arose in relation to specific study plans. As a result of military activities, the meteorological an

precipitation-measurement station networks in Slovakia, Silesia, and a great portion of Moravia suffered considerable damage.

This was the state of meteorological science in Czechoslovakia as of the end of World War II. The most immediate task was to restore the functioning of the higher educational institutions on Czech soil after a 5½-year hiatus. Lectures on meteorology were initiated in the natural sciences department of Charles (Karlovyy) University as early as the summer of 1945. Studies were centered at the University meteorological institute, once again under the direction of Professor and Doctor F. Nemalick, who remained at this post until his retirement. In 1950, the institute was placed under Professor and Doctor A. Gregor.

In 1946, Assistant Professor M. Koncek, Ph.D., received the title of professor in the natural sciences department of the University Imeni Komensky in Bratislava, and was simultaneously appointed to the directorship of the newly-created Institute of Meteorology and Climatology. Studies were also resumed at the Bratislava University, after virtually complete suspension during the last year of the War. The need for degree-holding meteorologists had been rising steadily, thus making it necessary to intensify university training of specialists in this field. As part of the 1957 reorganization of higher educational institutions, the original University institute was transformed into a meteorological and climatological scientific research laboratory.

In addition to the universities at Prague and Bratislava, which are presently training meteorology specialists, the Geography Institute at the University in Brno was also engaged in scientific studies on meteorology and climatology prior to World War II. Valuable services at that institution had been rendered by Docent B. Grudicka, executed by the German fascists at Mauthausen. In 1950, Professor and Doctor M. Koncek was invited to come to Brno in the status of a non-staff professor in order to improve the situation as regards the needs of academic practice in relation to those of scientific research activity; he continued to work at that institution until 1953. Upon his departure, the direction of the climatology department of the Geography Institute was assigned to Docent M. Nocek, Ph.D.

The training of meteorologists for special assignments had been temporarily instituted at other higher educational institutions as well. A cycle of lectures on meteo-

rology and climatology was introduced as a compulsory auxiliary subject for students at the Forestry and Agriculture Institute in Prague; the lectures on meteorology at that institution are given by Docent Uglirz; lectures on meteorology and climatology were also organized at the Brno and Nitra agricultural institutes, and the forestry institute at Zvolen.

The meteorological service of Czechoslovakia is at present centered at the Hydrometeorological Institute in Prague (GMI -- Gidrometeorologicheskiy institut) and its Bratislava branch (filial); this Institute was formed as a result of the merging of state meteorological and hydrological institutes. After the end of World War II, the former State meteorological institutes succeeded in reconstructing the network of meteorological observation stations, which was severely damaged, especially in Slovakia. In 1947, after the repair of the suspension-cable road to Lomnitskiy Shchit (Lomnitzer Spitze) damaged by the Germans during their retreat, the activities of the high-altitute observatory atop Lomnitskiy Shchit were resumed. In 1950, the number of meteorological stations already exceeded the pre-war figure.

In addition to the creation of meteorological stations with permanent staff workers, a significant step in meteorological development was the construction of a two-story institutional building in the Kolliba area of Bratislava; the Slovakian branch of the GMI was transferred to these new quarters in 1951 (Figure 1 -- see Supplement, page 204b) [not reproduced here]. An observing station for the Observatory was erected on a portion of the large adjoining parcel of land. Somewhat later, an agricultural meteorology observatory was set up in the village of Doskany; a biometeorological observatory was created in the town of Oradec [illegible]slove. Aerological stations were set up in Prague and Poprad. In 1959, a building in the village of Komorzhany near Prague was equipped to house the synoptic branch of the GMI. Permanent meteorological stations built as part of the program for the creation of high-altitude observation points were erected atop the following peaks: Duranov, Praded, Lysaya Gora, and Hopok in the Lower Tatras. The network of data-gathering centers in the mountainous regions of Slovakia, now equipped with over 30 pieces of apparatus, has been restored and supplemented.

A radiation center heading the entire network of actinometric branch stations was organized at the Bratislava

department of the GMI. A teletype and wirephoto communications network was set up in the interests of improving telecommunications linking together the cities of Prague, Brno, Bratislava, Kosice, and Poprad. In addition, an international teletype communication relay point was set up in Prague. As a result, Prague has become the only center in Europe with a teletype linkage center between Moscow, Warsaw, Budapest, Vienna, Berlin, and Frankfurt-am-Main. A mechanized computing center for statistical observational data processing was established at the Prague Institute. Independent translation, photographic, and publication material copying bureaus were set up at the GMI headquarters in Prague for the purpose of implementing technical and economic information services. The synoptic and climatological services of the Institute are constantly receiving the very latest in equipment. Considerable attention is devoted by the Institute to phenological studies; the administration of the phenological station network in Czech regions was included in the Institute's activities as early as World War II, while that of the stations in Slovakia -- beginning in 1949.

Further opportunities for developing scientific research activities presented themselves following the creat of the Czechoslovakian Academy of Sciences (ChSAN -- Ckheslovatskaya Akademiya Nauk) in 1952 and the Slovakian Academy of Sciences (SAN -- Slovatskaya Akademiya Nauk) in 1953. Within the framework of the Geophysics Institute (GI) of the ChSAN, a meteorological department for dealing with problems of atmospheric physics was organized in the town of Gradec Kralove in 1954. The department is headed by Doctor Y. Penkimek, who is presently also concerned with questions relating to atmospheric chemistry. In subsequent years, a climatological department headed by Doctor F. Rejn was established at the GI of ChSAN. The basic sphere of concern of this particular branch of GI ChSAN is the study of dynamic climatology; organizationally attached to this department is the meteorological observatory atop Milesovka in the Czech Stredegorzje, formerly under the Meteorological Institute at Charles University in Prague. The newest link in the GI ChSAN Meteorological network is the short-range weather forecasting department founded by Docent S. Brandejs, Ph.D. Plans for the future include the establishement of an independent meteorological institute or laboratory directly under ChSAN through a merger of the above-mentioned meteorological links in the GI of ChSAN.

After the creation of the Slovakian Academy of Sciences in Slovakia in 1953, a climatological department was created within the framework of the existing Geography Institute. At that time, the direction of the entire Institute was entrusted to Professor and Doctor M. Koncek. The climatology department of the SAN Geography Institute is concerned with the problems of regional climatology in Slovakia and dynamic climatology in cooperation with the climatology department of GI ChSAN. Starting in 1958, an agreement-covered program of cooperation with Polish meteorologists went into effect; the fruits of this program are to be made manifest through the joint publication of a monograph dealing with the meteorology and climatology of the High Tatras.

The Meteorology Institute of Charles University in Prague is directing its efforts toward the solution of problems involved in computational weather forecasting, as well as the climatology of the city of Prague. In addition to these activities, the above-named Institute is cooperating with meteorologists in the German Democratic Republic in connection with the problems of meteorology and climatology of the Krusne Hory area. The meteorology and climatology laboratory of the Komensky University in Bratislava is presently cooperating with SAN in studying the meteorology and climatology of the High Tatras. Another problem being dealt with at the meteorology and climatology laboratory is the study of wind conditions in Slovakia and several special questions of atmospheric circulation. The basic research task of the climatology department at Brno University is the study of the climatology of Moravia and Silesia, which represents a continuance of the traditional research subject matter dealt with at the Geography Institute during the pre-World War II period. Along with these activities, the meteorology and climatology section of the geography department cooperates both with the climatology department of GI ChSAN and the climatological department of the SAN Geography Institute on the problems of dynamic climatology in the Czechoslovakian Republic. Also receiving study are the problems of modern climatic fluctuation and local climate, with special reference to the climate of cities.

Other meteorological and climatological branches in various agricultural and forestry institutes, insofar as they are conducting research, devote their attention to the problems of agricultural bioclimatology. The problems of bioclimate and microclimate are also dealt with at the Hygiene

Institute in Prague, headed by Doctor V. Struzka. Research work conducted by the CMI is concerned mainly with the problems of long- and medium-range weather forecasting. The staff at the Slovakian branch of the CMI in Bratislava recently completed a detailed study of the climatological conditions of Nurbanov.

For his work in the field of meteorology, the City of Bratislava award for the year 1950 was conferred on Professor and Doctor M. Koncek; in 1953 he was elected Corresponding Member of the SAN. In 1956 Professors and Doctors S. Hanslick, A. Gregor, and M. Koncek received degrees of Doctors of Physico-Mathematical Sciences. At the time that ChSAN was established, a meteorological commission was organized within its physico-mathematical section; the commission has been headed since 1955 by Professor and Doctor A. Gregor. Seve years ago, Professor and Doctor M. Koncek was elected to serve as a member of the editorial board of the Hungarian scientific journal Idojaras, and was also invited to join the Austrian Meteorological Society. The Czechoslovakian Meteorological Society was organized under ChSAN in late 1958; one of its functions consists in holding report and lecture sessions. The Society includes over 300 Czechoslovakian members. A Slovakian branch of the Society is presently being organized under SAN in Bratislava.

The Czechoslovakian meteorological service took part in the work of the International Geophysical Year and is continuing its activities within the scope of international geophysical cooperation in the field of expanded meteorological, aerological, and actinometric observations. The director of the meteorological observatory atop Lomnitskiy Shchit, A. Mrkos, took part in the Third Soviet Antarctic expedition during 1957-1959, at which time he conducted meteorological and geophysical observations at Mirnyy Station and the interior of the continent. In 1959, the head of the aerological section of CMI, Doctor O. Kostka, left together with the Fifth Soviet expedition into the Antarctic.

Under the conditions of a people's democracy and a planned economy, the significance of meteorology in everyday life has grown considerably. For this reason, the country's central agencies (uchrezhdeniya) are issuing demands to the CMI and other meteorological institutions for the develop of extensive research programs relating to the various ...ches of the national economy. It was in this way that data had been prepared for the State water resources plan, and mete-

rials having to do with the construction of various enterprises and the preparation of plans for regional subdivision were worked out. In addition to the staff members of the GMI at Prague and Bratislava, workers at higher educational institutions and various other agencies also took part in these tasks.

The number of workers employed in the field of meteorology at the Hydrometeorological Institutes in Prague and Bratislava has increased considerably, while the total increase in the number of workers over that of 1945 has reached 140%. The number of staff members at the higher educational institutions and newly-created meteorological branches of the academies is still relatively small, however.

The foreign ties of Czechoslovakian meteorologists are rather extensive. The Hydrometeorological Institute sends its representatives to the majority of the important confere of the World Meteorological Organization of the United Nations, which settle questions of principle involved in the handling of meteorological work on a global scale. On the invitation of foreign scientific research institutions, some of our meteorologists have visited the USSR, Rumania, Bulgaria, and Sweden. Many young scientific workers have been commandeered abroad to gain familiarization with foreign meteorological practice and scientific institutions, as well as to establish personal ties. Under regular international programs for exchanging publications, the GMI maintains ties with 92 foreign institutions.

As was mentioned above, beginning in 1946, the representatives of the GMI have been taking part in numerous conferences held by the International, and later the World Meteorological Organization. The first conferences following the end of the War were devoted to the problems of organizing meteorological work and establishing international contacts interrupted by World War II. Such conferences are concerned almost solely with matters of an organizational character, and are held fairly often, since the requirements being placed before meteorology on a world scale are constantly increasing.

In Czechoslovakia, the GMI has organized four meteorological conferences without the participation of foreign representatives. The first conference of this type was held in 1952 in Bratislava; the second conference was organized the same city. The third conference, which was also concerned with hydrological problems, was held in Prague in 1954, and

finally the fourth conference took place once again at Bratislava. Many scientific papers and reports dealing with observation methods and data processing were presented at the above-mentioned conferences.

The climatological department of the SAN Geography Institute held a conference in 1956 at the House of Scientific Workers in Smolenice in order to discuss the plan put forth by a scientific workers' collective on the delimitation of the natural climatological regions in Czechoslovakia. Scientists from the USSR, Poland, and Hungary also took part in this conference. In 1959, the climatology department of the SAN Geography Institute together with the University in Banska Bystrica organized a symposium on the problems of meteorology and climatology in the Carpathian region; the meeting was held in Smolenice. In addition to local participants, among the conference delegates were representatives from the USSR, Poland, Hungary, German Democratic Republic, and Austria. At all of the conferences devoted to the meteorology and climatology of the Carpathians, resolutions were adopted in favor of continuing the initiated work in the future. The next meeting of this type will be held in 1961 in Budapest.

In addition to participating in the organizational conferences of the World Meteorological Organization, Czechoslovakian meteorologists have attended a number of scientific conferences abroad, such as the following: the 8th Congress of the International Geodetic and Geophysical Union held in Oslo in 1948; the conference of hydrologists and meteorologists in Budapest in 1952; the conference on long-range weather forecasting in Budapest in 1954; the 3rd international conference on the problems of Alpine meteorology held in 1954 at Obergurgl, Austria; the 1956 conference on computational forecasting held in Frankfurt-am-Main in 1956; the 1958 conference at Basel; in 1956, the conference of the Hungarian Meteorological Society at Gyor (Raab) and the 4th international conference on Alpine meteorology at Chamonix; in [illegible]7, the 11th Congress of the International Geodetic and Geophysical Union in Toronto, the 1st Congress of the International Bioclimatological and Biometeorological Society in Vienna, and the meteorological conference in Berlin, held in connection with the founding of the meteorological society in the German Democratic Republic; in 1958, the 5th international conference on Alpine meteorology at Garmisch-Partenkirchen, and in 1959 the special colloquium of the Geophysics Institute at Karl Marx University in Leipzig, in honor of the

500th anniversary of the founding of this institution of higher learning.

In the spring of 1958, joint Polish-Czechoslovakain efforts were initiated toward the publication of a monograph on the meteorology and climatology of the High Tatras. The coordination of the effort is handled by a six-member commission on Polish-Czechoslovakain cooperation which meets on a regular biannual basis alternately in Poland and Slovakia and invites additional interested scientists to attend its meetings. At the 4th session held in late 1959 in Bratislava, the basic principles of materials processing from various points of view were worked out.

The opportunities for the publication of works h[illegible] improved considerably over the pre-World War II pe[illegible]d in the last 15 years. In addition to a number of specialized and pedagogical publishing houses regularly issuing works on meteorology and climatology, it is necessary first of al[illegible] to mention the ChSAN and SAN publishers, which publish book[illegible] as well as other material. The publication of the first Czechoslovakian meteorological journal, Meteorologicke zpravy, was initiated by CHI in 1947. The journal Studia Geophysica et Geodaetica, published by ChSAN primarily for maintaining contact with foreign scientific institutions, began to appe[illegible] in 1957. Works of a climatological character often appear in the organ of the Czechoslovakian Geographic Society, Zemepisny sbornik (Earth-Science Journal) as well as a similar Slovakian periodical Geograficky casopis (Geographic Journal), published by SAN in Bratislava. Individual works are published in the collections of specific departments in the institutions of higher learning. CHI publishes the results of observations made at the meteorological stations in its yearbooks; this Institute likewise prints instructions for observers and some of the works of its staff members.

The writing and publishing activities of Czechoslovakian meteorologists have been rather extensive. In additions to numerous minor papers and climatological data analyses, it is necessary to mention the main areas dealt with in significant published works. Doctors Bradka and Z. Gregor have written on general atmospheric circulation and the prob[illegible]s of medium-range weather forecasting; Doctor I. Ilek has been concerned with long-range weather forecasts; Docent S. Brandejs, Ph.D., and his associates published a number of papers in the field of computational forecasting, Doctor I. Podzim[illegible] has worked systematically in the field of water vapor con-

deposition and sublimation, as well as atmospheric chemistry. Professor and Doctor M. Koncek and Doctor F. Kojn worked out a typical pattern of synoptic situations for the purposes of dynamic climatology. In addition to this, Doctor M. Koncek has been concerned with problems relating to the appearance of hoar-frost in mountainous areas and has suggested a so-called index of moisture saturation for expressing soil moisture conditions as they depend on several meteorological or climatological factors; he was later engaged in the processing of data obtained over several years of air temperature measurements in Bratislava. Professor and Doctor Gregor has been studying the problems of health-resort climatology and methods of expressing weather and climate conditions by means of a point system. Doctor S. Petrovic used an alternative method of complex climatology in studying several areas in Czechoslovakia. Doctor L. Kruivskij worked on the problem of cosmic influences on atmospheric phenomena and has dealt with centurial climatic changes. Docent M. Nocek, Ph.D., has employed advanced statistical techniques for describing the annual course of changes in precipitation. Doctor J. Picha has worked successfully in the field of actinometry an measurement of atmospheric ozone. Doctor V. Struzka has been designing special apparatus and working out methods of making microclimatic measurements in the field.

The Climatic Atlas of Czechoslovakia, the result of a cooperative effort of the Prague and Bratislava branches of CHI, was published in late 1958. The Atlas contains 80 maps and 11 pages of diagrams; as regards the basic meteorological factors, the Atlas was compiled largely on the basis of observational data taken over the years 1901-1950. Both from the standpoint of scientific treatment and typographical craftsmanship, the Atlas represents a very careful piece of work indeed; it can thus claim a worthy place among analogous works recently published abroad. In addition to the usual cartographic presentations of various climatic elements, the Atlas also contains a number of maps of a general character, as well as a map of the climatic regions of Czechoslovakia, all of which were drawn according to a method worked out by a team of Czech and Slovakian meteorologists. Some of the other more or less major publications are the guide for climatologists entitled "Practical Climatology" by Docent Nocek, Ph.D. (1954), "Measurement Methods in the Meteorology of the Lower Atmospheric Layers" by Doctor F. Kocourek (1950), "Temperature Conditions in Bratislava" by Professor

and Doctor M. Koncek (1956), "Meteorological Apparatus and Measurements in Nature" by Doctor V. Struzka (1956), "Introduction to Computational Weather Forecasting" by Docent F. Brandejs, Ph.D. (1957), the survey "The Physics of Clouds and Precipitation" by Doctor I. Podzimek (1959), and finally "Engineering Meteorology and Climatology" by Professor and Doctor Smolik and Doctor V. Struzka (1959). In print at the present time is the collective work of the Bratislava climatologists at the CMI entitled "The Climatic Conditions of Hurbanov" (to appear in 1960).

In addition to this, there have been published a number of popular-scientific and purely popular works on the various facets of meteorology aimed at informing the general public about the latest achievements of meteorology and their practical applications. The CMI has published several handbooks and sets of instructions for observers working in the network of meteorological, precipitation-measurement, and phenological stations. Translations of several valuable Soviet textbooks and handbooks have also appeared.

In 1952 Professor and Doctor M. Koncek completed work on the design of an apparatus for the automatic registration of hoar-frost incrustation, the so-called heligraph. In December 1954, the discovery administration in Prague issued a patent to him on this device. In 1954 the staff members at the CMI in Bratislava built a prototype of a weight snow meter which is presently being mass-produced. S. Kozumplik, a staff member at CMI in Prague has designed a new type of anemograph based on the self-induction principle.

It is evident from the present brief survey that despite the manifold difficulties which arose during the first years following World War II, Czechoslovakian meteorology in a relatively short time succeeded in repairing the damage inflicted during the foreign occupation, as well as the damage caused over a rather extensive territory by direct military action. Now the Czechoslovakian meteorologists can look back with a clear conscience on the last fifteen years of their activity and draw from past experiences new strength for an even greater development of scientific research in free Czechoslovakia.

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